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(56) Documents Cited

GB 2346268 A

GB 2334155 A

GB 2326540 A

GB 2310547 A

EP 0488894 A1

WO 97/19501 A1

US 6007372 A

US 5807140 A

US 5664229 A

US 5654593 A

(58) Field of Search

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(54) Abstract Title

Adaptor for connecting computer to rechargeable article

(57) An adaptor for connecting a computer to a rechargeable article comprises a plug 11 suitable for electrically connecting with a port on a computer and a plug 14 suitable for electrically connecting with the rechargeable article (eg a mobile telephone) whereby electrical power is tapped from the port of the computer and supplied to the rechargeable electrical article. The adaptor may also have a through-port 15 which duplicates the computer port. The plug 14 for the rechargeable article may include a transformer on a pcb.

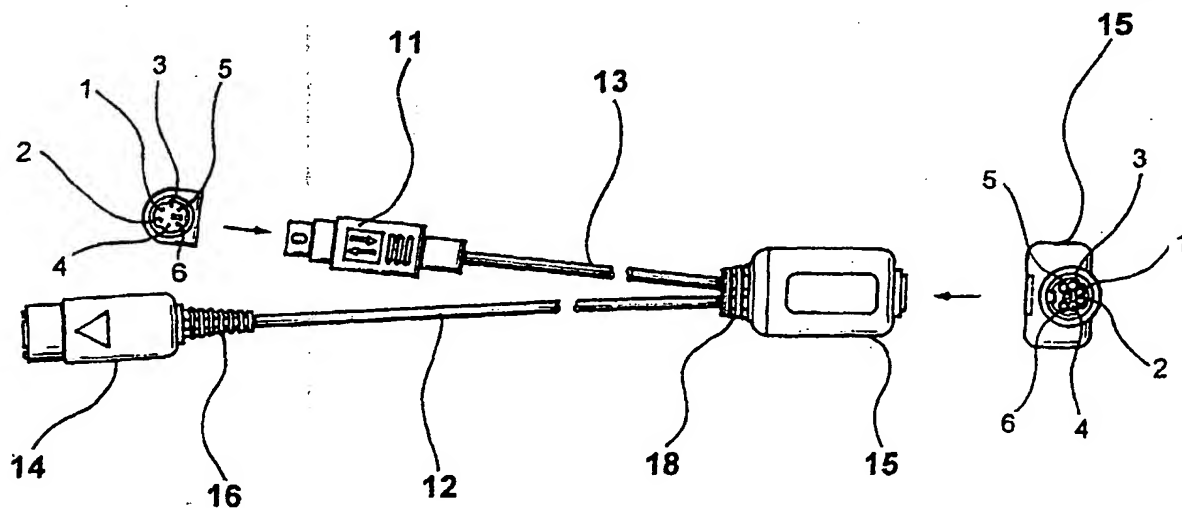


Figure 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

GB 2 363 916 A

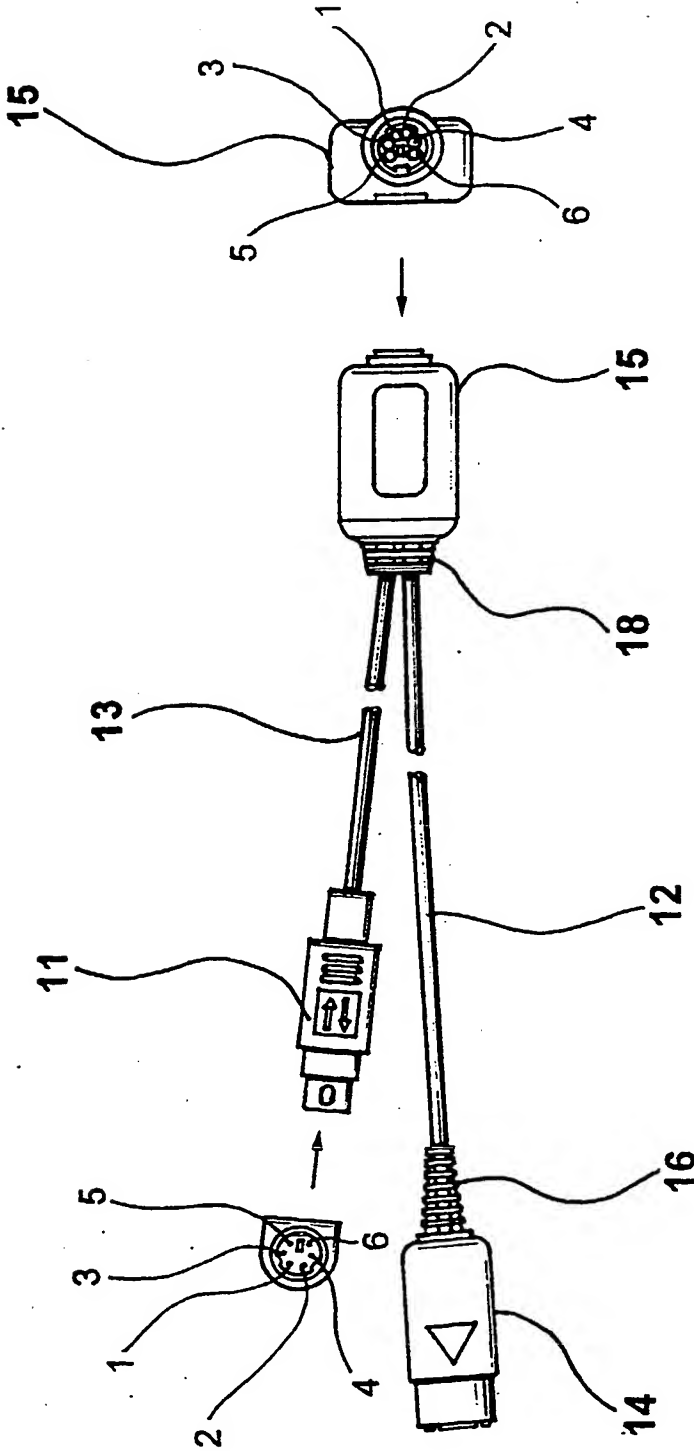


Figure 1

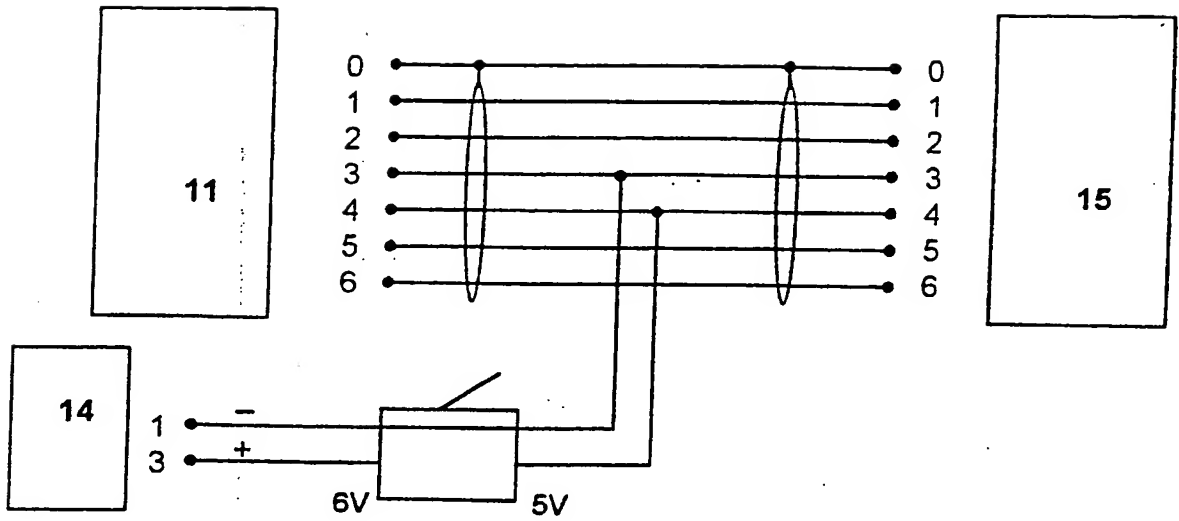


Figure 2

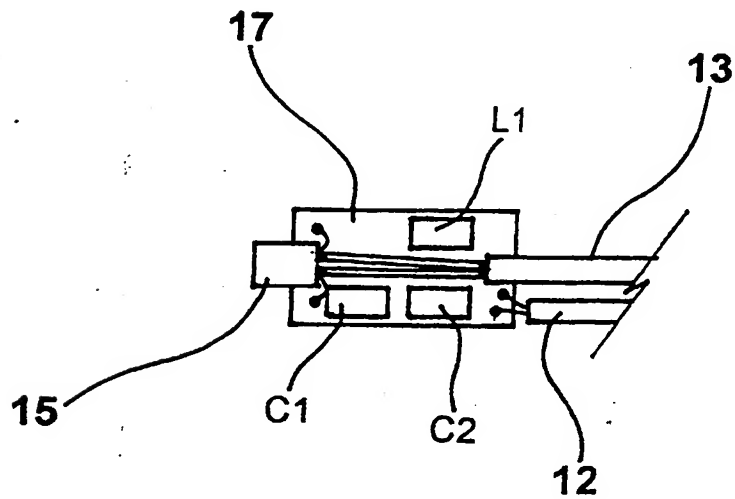


Figure 3

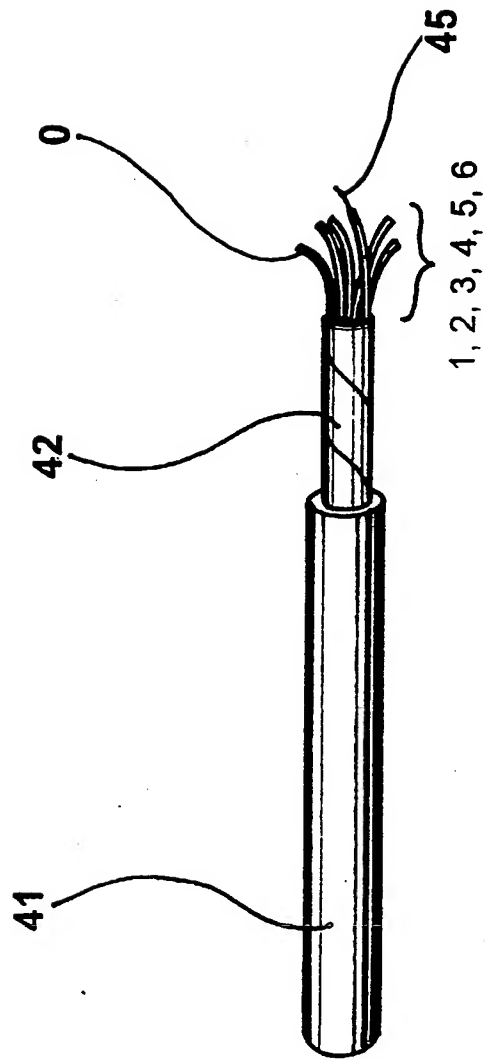


Figure 4

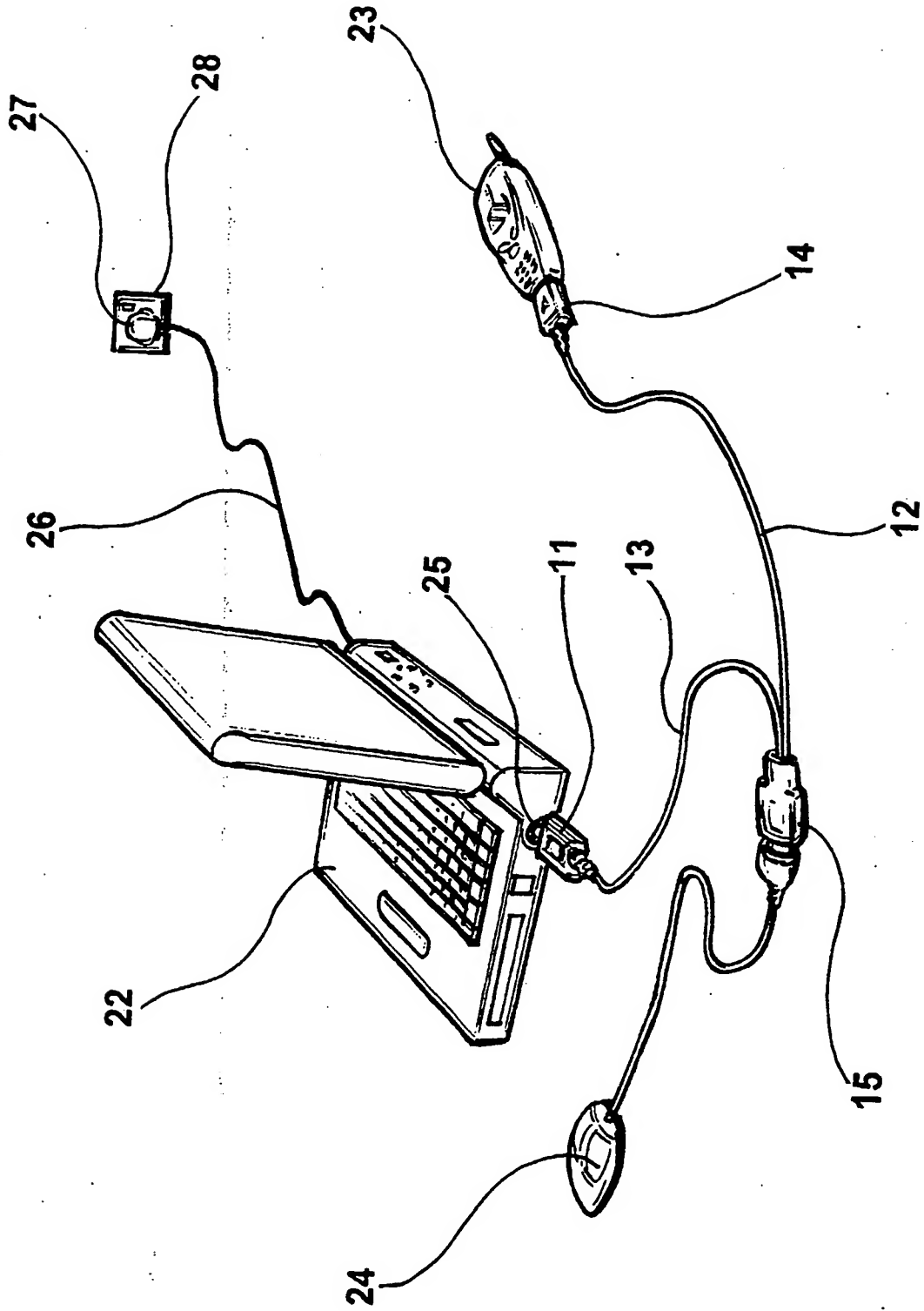


Figure 5

APPARATUS FOR CHARGING A RECHARGEABLE ELECTRICAL ARTICLE

The present invention relates to apparatus for charging a rechargeable article of electrical equipment such as a mobile telephone, digital camera, electric razor or the like. Most particularly, the invention relates to an adaptor plug and cable therefor.

Rechargeable electrical articles are well known. Such articles are typically provided with a cable which plugs to the electricity mains supply at one end and into the power supply of the electrical article at the other thereby enabling the rechargeable power supply to be charged directly from the electricity mains supply. Recharging accessories are also available in the form of "in-car" chargers. These accessories generally comprise a cable with one plug which plugs into the cigar lighter socket of the car and a second plug which plugs into the power supply of the electrical article to be recharged. The power supply is then recharged from the car battery.

It will be appreciated that, with the prior art apparatus, a different plug is needed to plug into sockets of different domestic electricity supplies or car cigar lighter sockets. Thus, when travelling, the user of a rechargeable article needs to carry with him an electrical adaptor to suit the supply sockets in the country where he intends to use and recharge his electrical equipment.

Business travellers often travel with a multitude of electrical gadgets to enable them to work whilst away from the office. Typically, a traveller's collection of gadgets will include a lap top or palm top computer and a mobile telephone, each of which will periodically need to be recharged by connection with the local mains electricity supply. If the traveller only has one suitable mains plug adapter, then he is only able to charge one article at a time. Even if he has suitable adapters for each of his rechargeable articles, it is often difficult to locate more than one easily accessible mains plug socket in a hotel room since many of the electrical items provided in such rooms are permanently wired to the mains supply to make it more difficult for thieves to remove these items.

The present invention seeks to overcome or in some way alleviate the problems encountered with the prior art.

In accordance with the present invention there is provided an apparatus for charging a rechargeable electrical article comprising;

a system of electrical cable connecting a first plug suitable for electrically connecting with a port on a computer with a second plug suitable for electrically connecting with the rechargeable power supply of the rechargeable electrical article whereby electrical power is tapped from the port of the computer and supplied to the rechargeable electrical article thereby enabling charging of the rechargeable power supply.

The second plug may incorporate a transformer to adjust the voltage of the electrical supply tapped from the computer to a voltage suitable for charging the rechargeable electrical article. The transformer is conveniently provided in the form of a printed circuit board which is incorporated into a housing with the plug.

The computer may be any computer including a desk top personal computer, but is conveniently a lap top, palm top or electronic book with a facility for electrical connection with removable peripheral devices. The port may be any port with which an electrically operated peripheral can be removably connected, for example; a mouse port, a disk drive, a printer port, a keyboard port, a memory card port or a port for receiving computer game peripherals such as a control pad or steering wheel accessory. Equally any PCMCIA or USB outlet may be used to connect the first plug with the computer. The term "port" herein is intended to encompass all the aforementioned. Examples of rechargeable electrical articles to which the apparatus can conveniently be applied include; mobile telephones, digital cameras, electric razors, pagers, beepers and the like.

It is to be understood that by providing different plugs, the apparatus of the present invention can be readily adapted for use with a large variety of different

rechargeable electrical devices. Similarly, by providing different plugs suitable for electrical connection with different ports of various computers, the apparatus can be adapted to be connectable with a preferred port chosen by the user.

Optionally, the apparatus may further comprise a jack which essentially duplicates the port with which the first plug is configured to be electrically connected. The jack may be integrated in the same moulded unit as either of the two plugs or may be connected between the plugs by means of a second electrical cable. Most preferably, two cables extend from the jack and connect one with each of the first and second plugs. Embodiments incorporating this feature permit an electrical article such as a mobile telephone to be recharged without the loss of functionality of the computer port. For example, if the port is configured to receive a connection to a mouse, the apparatus enables the user to recharge his mobile telephone whilst still having his mouse connected with the mobile computer. This permits him to work on his computer with full use of all its peripherals whilst simultaneously recharging another electrical article.

For the purposes of exemplification, an embodiment of the invention will now be described in more detail with reference to the figures in which;

Figure 1 shows an exploded view of one embodiment of the invention;

Figure 2 shows a wiring diagram for the embodiment of figure 1;

Figure 3 shows a schematic of the electrical circuitry of the jack of the embodiment of Figure 1;

Figure 4 shows, in more detail, the computer cable of the embodiment of Figure 1;

Figure 5 shows the embodiment of Figure 1 connected to a lap top computer, mouse and mobile telephone in accordance with the invention.

As can be seen from the figures, the exemplary embodiment of the invention comprises a plug 11 configured for connection with a standard P/S2 mouse port 25 of a lap top computer 22. A computer cable 13 connects the plug 11 with a jack 15 which replicates the PS/2 mouse port 25 so that a mouse 24 may be connected with the lap top computer 22 via the embodiment of the invention.

Extending from the jack 15 is a second, two core cable 12. This connects with a mobile telephone charger plug 14 configured to connect with the rechargeable power supply of a mobile telephone 23. The two core cable 12 taps a low voltage power supply from the jack 15 for charging the mobile telephone 23. The two cables 12, 13 are connected via a printed circuit board (PCB) 17 in the jack 15 as illustrated in figure 3. The cables 12, 13 and held in position adjacent the jack 15 and charger plug 14 by strain reliever members 18 and 16 respectively.

As can be seen from Figures 2 and 4, the computer cable is a 6C + I + AL shield computer cable comprising six wires (1, 2, 3, 4, 5, 6) insulated by variously coloured PVC sheaths, a tinned copper drain wire 0, and a bare copper conductor wire 45. The wires are collectively sheathed in an Al Mylar binding 42 which in turn is surrounded by a PVC jacket 41. Wires 1 and 3 of the two core cable 12 join cable 13 at wires 3 and 4 and connect at their other termini with PCB 21 of charger plug 14.

In use, as is illustrated in figure 5, the plug 11 is inserted into the mouse port 25 of a lap top computer 22. The jack 15 receives the plug of a mouse 24 which communicates with the lap tap computer 22 though cable 13 and plug 11. At the same time, charger plug 14 is plugged to the rechargeable power supply of mobile telephone 23. The charger plug 14 receives electrical power through cable 12 via PCB 17 (not shown), cable 13 and the electrical connection made by plug 11. With the mouse port 25. If the power supply of lap top 22 were charged, then the power supply for charging the mobile telephone could be taken directly from the battery of the lap top 22. Preferably, however, the lap top 22 is connected with a mains electricity supply via a power cable 26 and plug 27 which electrically connects with mains supply socket 28. Thus both the mobile telephone 23 and lap top computer 22 and its peripherals

including the mouse 24 can be powered by the mains electricity supply through a single mains connection 27,28.

It is to be understood that the foregoing is merely exemplary of one embodiment of the invention and is not intended to restrict the true scope of the invention as defined by the appended claims. In particular, it should be appreciated that by use of known electrical technologies, embodiments of the invention could be produced allowing connection of any of a number of rechargeable electrical articles with any number of electrical power outlets provided on a computer.

CLAIMS

1. An apparatus for charging a rechargeable electrical article comprising;

a system of electrical cable connecting a first plug suitable for electrically connecting with a port on a computer with a second plug suitable for electrically connecting with the rechargeable power supply of the rechargeable electrical article whereby electrical power is tapped from the port of the computer and supplied to the rechargeable electrical article thereby enabling charging of the rechargeable power supply.
2. An apparatus as claimed in claim 1 further incorporating a jack which duplicates the port with which the first plug is configured to be electrically connected, thereby permitting recharging of the electrical article without loss of functionality of the computer port.
3. An apparatus as claimed in claim 2 wherein the jack is integrated in the same moulded unit as either of the other two plugs.
4. An apparatus as claimed in claim 2 wherein the jack connects with the first plug via a computer cable and with the second plug via a two core cable.
5. An apparatus as claimed in any preceding claim wherein the second plug incorporates a transformer means to adjust the voltage of the electricity supply tapped from the computer to a voltage suitable for charging the rechargeable electrical article.
6. An apparatus as claimed in claim 5 wherein the transformer means is provided in the form of a suitably configured printed circuit board.
7. Apparatus as claimed in any preceding claim wherein the computer is a portable computer, such as a lap top, palm top or electronic note book.

8. Apparatus as claimed in any one of claims 1 to 6 wherein the computer is a desk top personal computer.
9. Apparatus as claimed in any preceding claim wherein the rechargeable electrical article is a mobile telephone.
10. Apparatus as claimed in any of claims 1 to 8 wherein the rechargeable electrical article is a digital camera.
11. Apparatus as claimed in any preceding claim wherein the computer port is selected from; a mouse port, a disk drive, a printer port, a keyboard port, a memory card port or a port for receiving computer game peripherals such as a control pad or steering wheel accessory.
12. Apparatus as claimed in any one of claims 1 to 10 wherein the computer port is a PCMCIA or USB outlet.
13. Apparatus substantially as described herein with reference to the Figures 1 to 5.



INVESTOR IN PEOPLE

Application No: GB 0017876.4
 Claims searched: 1 to 13

8

Examiner: Mr F J Fee
 Date of search: 21 August 2001

Patents Act 1977

Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): H2E [ECAJC, ECSF, ECSH, ECSX]

Int Cl (Ed.7): H01R

Other: On-line: EPODOC, WPI, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2346268 A	[LOUGHBOROUGH]	1, 5
X	GB 2334155 A	[NAN-CHEN CHEN] power connector is split from computer's power port	1 to 4, 8
X	GB 2326540 A	[FORMOSA]	1, 5, 6
X	GB 2310547 A	[SPENCE]	1, 5, 8
X	EP 0488894 A1	[BULL] power port SCM3 split from data/power port FCM	1
X	WO 97/19501 A1	[BRAUN]	1
X	US 6007372	[WOOD] connector 11 for computer port and connector 12 which is connected to power lines of computer port	1, 2, 4, 7
X	US 5807140	[HOPKINS] connector 20 connected to power connector 24 and through connector	1, 2, 3
X	US 5664229	[BHARGAVA] column 6 lines 46 to 54; power connector 240, figure 2	1, 8

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



INVESTOR IN PEOPLE

Application No: GB 0017876.4
Claims searched: 1 to 13

Examiner: Mr F J Fee
Date of search: 21 August 2001

Category	Identity of document and relevant passage	Relevant to claims
X	US 5654593 [MURATA]	1 to 4

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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